

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 32390-160392	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US 00/ 17024	International filing date (day/month/year) 21/06/2000	(Earliest) Priority Date (day/month/year) 21/06/1999
Applicant UNIVERSITY OF MARYLAND, BALTIMORE		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of Invention is lacking** (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

THIENYLHYDRAZON WITH DIGITALIS-LIKE PROPERTIES (POSITIVE INOTROPIC EFFECTS)

5. With regard to the **abstract**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

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☐ None of the figures.

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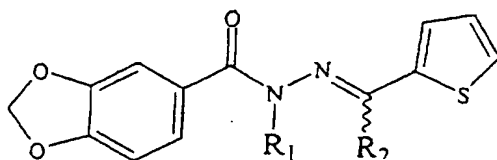
International application No.

PCT/US 00/17024

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

The invention discloses a compound having the formula (I)

(I)



wherein,

R_1 is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms, unsubstituted phenyl, and substituted phenyl;

R_2 is selected from the group consisting of H, alkene, un-substituted phenol, and substituted phenyl; and

pharmaceutically acceptable salts thereof, having digitalis-like properties. The invention further discloses a novel method to synthesize 3,4-methylenedioxybenzoyl-2-thienylhydrazone (LASSBio-294). LASSBio-294 produces positive inotropic effect on cardiac and skeletal muscle. The invention is useful for the treatment of congestive heart failure and muscle fatigue. It lacks toxic effects seen in digitalis glycosides.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07D409/12 A61P9/04 A61K31/381 A61K31/34

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BEILSTEIN Data, CHEM ABS Data, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	KUCUKGUZEL S G ET AL: "Synthesis and antimycobacterial activity of some coupling products from 4-aminobenzoic acid hydrazones" EUROPEAN JOURNAL OF MEDICINAL CHEMISTRY.CHIMICA THERAPEUTICA,FR,EDITIONS SCIENTIFIQUE ELSEVIER, PARIS, vol. 34, no. 12, December 1999 (1999-12), pages 1093-1100, XP004186879 ISSN: 0223-5234 the whole document --- -/--	1-23



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

30 October 2000

Date of mailing of the international search report

15/11/2000

Name and mailing address of the ISA

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Stellmach, J

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/17024

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	MAZZONE, G. ET AL.: "2-Pyridyl-5-alkoxyphenyl--1,3,4-thiadiazoles by the action of Sulfur on Methylpyridines in the Presence of Alkoxyhydrazines" J.HETEROCYCLIC.CHEM., vol. 21, 1984, pages 181-184, XP000942801 ALBUQUERQUE the whole document ---	1-23
Y	MAZZONW, G. ET AL.: "Su alcuni aroilidrazoni di alogenobenzaldeidi e 2,5-diaril-1,3,4-ossdiazoli alogeno-sostituiti" IL FARMACO, vol. 33, 1978, pages 963-966, XP000942813 ROM the whole document ---	1-23
Y	TIHANY, E. ET AL.: "Pyrazolecarboxylic acid hydrazides as antiinflammatory agents. New selective lipoxigenase inhibitors " EUROP.J.MED.CHEM.-CHIM.THER., vol. 19, no. 5, 1984, pages 433-439, XP000942814 PARIS the whole document ---	1-23
A	EP 0 079 050 A (MERRELL DOW PHARMA) 18 May 1983 (1983-05-18) the whole document ---	1-23
A	EP 0 219 112 A (MERRELL DOW PHARMA) 22 April 1987 (1987-04-22) the whole document -----	1-23

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Information on patent family members

International Application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0079050 A	18-05-1983	US 4410540 A	18-10-1983
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